New Horizons

Traditionally, the first issue of IEEE Industrial Electronics Magazine (IEM) every year puts a spotlight on the IEEE Industrial Electronics Society (IES), its members, and its organization. The beginning of the new year is when important changes in the Society take effect, when the terms of new officers start, and when we welcome new Administrative Committee members. Toward the end of the previous year, the new IEEE Fellows are announced, and, at our flagship conference, the IES Annual Conference (IECON), we present the prestigious Society awards to merited members of the IES. As we start 2018, it is therefore appropriate that we commemorate the invaluable contributions of the people who make our Society strong in technical and organizational respects. This first issue of IEM is a good opportunity to give them the recognition they deserve. Indeed, there is exciting news to report.

This month’s issue is the first under the presidency of Prof. Xinghuo Yu, who took office at the beginning of the year. In his message, he shares his thoughts on industrial electronics not only for our technical IEEE Society but also for what it can bring to society in a broader sense. One of his key insights is that there is nothing to gain by thinking in simple terms; it is neither applied versus fundamental research, nor is it academia versus industry. Only a balanced mix of all of these approaches brings real innovation.

This issue also establishes a new column, “Women in IES News,” with Prof. Lucia Lo Bello as the associate editor. Sadly, despite many attempts to improve the situation, women are still grossly underrepresented across all engineering disciplines. Promoting women in engineering (WiE) has been a prominent activity within the IEEE and the IES for many years. In 2017, a new initiative began with a dedicated and highly successful workshop at IECON. This new column will give a voice to women engineers, their activities, and the initiatives run by them to encourage their active participation in the IES, with or without the WiE umbrella within the IEEE.

As for the technical content of this issue, the common denominator of the feature articles is the use of information technology for modern, distributed automation systems in different application domains. “To Centralize or to Distribute: That Is the Question,” by Z. Cheng, J. Duan, and M.Y. Chow, investigates the next generation of microgrids and how to control them. Microgrids can be seen as confined entities with certain autonomy within a smart grid. While they were previously considered from the perspective of stability in the event of disconnection from the grid, advanced microgrids can achieve energy generation and consumption balancing internally and, therefore, behave as autonomous parts of the grid. Coordination of these entities is a longstanding problem, and this article reviews classical centralized approaches versus distributed concepts, finding that the latter are advantageous in terms of scalability, reliability, and resilience.

The article “Industrial Cyberphysical Systems,” by B. Cheng, J. Zhang, G.P. Hancke, S. Karnouskos, and A.W. Colombo, looks at the value of modern cloud computing technologies in an industrial context. The Internet of Things, with massively connected devices together with cloud solutions, allows for the collection and storage of enormous amounts of data. Pure technological prerequisites are, however, only one aspect. A much more interesting question is what to do with these data, i.e., how to analyze and interpret them within the possibly short time frame given by industrial control and decision-making systems.

This article reviews architectural issues, existing frameworks, and industrial alliances driving the evolution of big data handling in industrial applications.

The “Historical” column, “Solidifying Power Electronics,” reviews the development of solid-state devices that are the foundation of modern power electronics. A large part of what constitutes the technical scope of the IES would be unthinkable without these devices, which convert electric power from dc to ac and vice versa. Last but not least, we also honor the recipients of the 2017 IES Awards, and we present the 15 IES Members who recently became IEEE Fellows. Congratulations to all of them and all of the award winners!